



Content edited for Yachting Pages - January 2014-

Clean Fuel?

Testing before bunkering, to avoid taking contaminated fuel onboard, is now an option with FUELSTAT® resinae, the onsite 10 minute fuel test.

How has fuel changed?

Internationally, pressure is growing to increase the percentage of bio-fuel in diesel and to reduce its sulphur content. These dual factors increase the potential for diesel bug growth as sulphur curbs bug growth and bio-fuel attracts additional water. The UK leisure industry is now faced with lower sulphur fuel across the board and the potential inclusion of bio-diesel, depending on the source of their fuel.

Diesel-bug

Diesel-bug can cause reduced filter life due to clogging and blockage, coalescer filter and centrifuge malfunctions and engine wear due to variations in fuel flow. Damage to in-line instruments, high fuel consumption and blockage of pipes and valves can also be caused by diesel-bug. Long term infestations can also result in corrosion of tanks and lines as the bugs are corrosive.

There are different types of microorganism, under the umbrella term 'diesel-bug,' which tend to act as a consortium. They can enter fuel at any stage in the supply chain and given sufficient moisture content will proliferate, as long as there is sufficient fuel. The bugs live in the water and consume the fuel generally speaking. They tend to be found around the water fuel interface. The increased use of bio-fuels is thought to exacerbate the problem because they have the organic compound FAME (Fatty-Acid Methyl Ester) added. This compound has a high affinity for water and provides additional organic matter to support the microorganisms.

Diesel fuel has traditionally contained a proportion of sulphur, at times up to 3500ppm or 0.35%. At this level it acts as an inhibitor or 'bio-stat' for microbial growth. The push to reduce its level is driven by environmental pollution concerns. European legislation has been implemented to reduce the sulphur content of fuel to 10ppm. This has 2 effects on engine operability. Firstly, the regulating influence of sulphur on microbes is lifted, and secondly, as sulphur acts as a lubricant to be replaced with additives, and these increased friction and wear will result unless suitable additives are found. These additives may have unforeseen knock on consequences.

Recommendations researched by Conidia Bioscience

The speed at which diesel-bug can multiply is of real concern, microbiological contamination stems from water content in fuel, but if you remove the water you remove the breeding ground. It is very difficult to remove the water from a system and experts describe this as the "holy grail" of fuel maintenance. At

present it is possible to control the problem with a combination of filtering, regular filter inspection, testing and treatment (including biocides, fuel polishing and mechanical cleaning). This can be time consuming and expensive but is considerably more straightforward and cheaper than dealing with any resulting tank and engine damage. Adding treatments prophylactically, ie adding a treatment without knowing if there is a problem, can produce resistant organisms – just like excessive anti-biotic use in humans, testing seems to be essential. Testing before bunkering, to avoid taking contaminated fuel onboard, is now an option with the introduction of the new 10 minute immunoassay method.

A fuel maintenance schedule, designed according to risk, should arguably begin with fuel testing to gauge the levels of diesel-bug in the system and there are several different types of test available. The main types are colony counting, ATP and Immunoassay testing, there are pros and cons with each method with regards to the time involved to obtain results, the cost, the equipment required and the expertise required to carry out the test. The choice of test will depend on the nature of the boat and the requirements of the engineer.

Gerry Herman Technical Manager, from Conidia Bioscience says *“Over the winter periods, all fuel tanks should be filled to 100 per cent this will help stop condensation forming on the tank walls. Tanks can be treated with biocides as a preventative measure and it is advisable to keep tanks at least a quarter or half full. The movement of the boat will splash diesel onto the walls of the tank and prevent condensation. The water should be drained from all fuel and water separators regularly, and the filters inspected and changed as per the servicing plan.”*

Fuel polishing can remove diesel-bug from the fuel but not the entire system; it is the equivalent of cleaning the furniture in a mould filled room but neglecting the ceiling and the walls, it will not take long before the walls and ceiling are still covered in mould. It will not take long for the furniture to be contaminated again. If the infestation is so bad that fuel polishing is necessary, it is important that the entire fuel system is also thoroughly cleaned.

Conidia Bioscience is expanding rapidly into the marine diesel sector, with the **FUELSTAT® resinae Plus** test. The onsite fuel test can be actioned wherever fuel is manufactured, stored, distributed or used and is capable of detecting all known organisms which grow in fuel and in fuel systems. The objective of this test is to provide rapid screening of fuel samples (water in fuel or fuel), giving a quick and accurate assessment of H Res, bacteria & other fungi including yeasts in the fuel tank. This test is unlike current growth-based tests which require a minimum of 72 hours to provide any results. The test measures the amount of active growth in the sample and provides actions and alert levels.

Why Test?

- Prevent contaminated fuel coming on board
- Protect your ship from blocked filters, engine failure and corrosion
- Reduce the costs of maintenance and repair
- Ensure the longevity of your engine

Why use **FUELSTAT® resinae PLUS**

- Detect both high and low levels of contamination within minutes
- Accurately identify the type of contaminants that may be present in your fuel
- Discover contamination at an early stage before it becomes problematic
- Easily determine the right course of action to treat the problem
- Keep a simple log of test results using the easy to read test paddles
- No special equipment needed – everything is provided
- All components of the test are completely disposable

Note to editor: Conidia are an internationally recognised organisation within the Bioscience sector. The Fuelstat® range of Rapid testing technologies for the detection of microbial contamination in light distillate hydrocarbon fluids (specifically diesels and kerosene) can be used throughout the fuel supply chain. Test capability applies in the aviation, marine and land environments, wherever kerosene or diesel is used, stored or transported. (www.conidia.com)